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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/834,798	04/03/97	PEDERSEN, D	20879-0009

MM51/1203

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EXAMINER	
SPARKS, D	
ART UNIT	**PAPER NUMBER**
2835	11

DATE MAILED: 12/03/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
08/834,798	Pedersen et al.
Examiner	**Group Art Unit**
Donald A. Sparks	2835

☒ Responsive to communication(s) filed on *Sep 16, 1998* .

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-18* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-18* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

The request filed on September 16, 1998 by Express Mail for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 08/834,798 is acceptable and a CPA has been established. The applicants have not requested that any amendments be made to the application. An action on the CPA follows.

1. INFORMATION CONCERNING DRAWINGS

Drawings

As required by **M.P.E.P. § 707.07** and **M.P.E.P. § 707.07(e)**, the examiner reminds the applicant's of the necessary drawing corrections required by the draftsman indicated on the PTOL-948 which accompanied the office action dated November 3,1997.

2. RESPONSE TO SUBMISSION OF TERMINAL DISCLAIMER

The Terminal Disclaimer submitted May 1, 1998 (COM 4-29-98) **has not been entered into the application** for the following described reasons:

The submission establishing the ownership interest of the assignee is informal. There is no indication of record that the party who signed the submission establishing the ownership interest is authorized to sign the submission **(37 CFR 3.73(b))**.

The assignee has not established its ownership interest in the patent, in order to support the terminal disclaimer. There is no submission in the record establishing the ownership interest by either (a) providing documentary evidence of a chain of title from the original inventor(s) to the assignee, or (b) specifying (by reel and frame number) where such documentary evidence is recorded in the Office (**37 CFR 3.73(b)**).

The following is a statement of **37 CFR 3.73**, which became effective on September 4, 1992, and was revised to its present form in 1997:

> **37 CFR 3.73 Establishing right of assignee to prosecute.**
> (a) The inventor is presumed to be the owner of a patent application, and any patent that may issue therefrom, unless there is an assignment. The original applicant is presumed to be the owner of a trademark application unless there is an assignment.
> (b) When an assignee seeks to take action in a matter before the Office with respect to a patent application, trademark application, patent, registration, or reexamination proceeding, the assignee must establish its ownership of the property to the satisfaction of the Commissioner. Ownership is established by submitting to the Office, in the Office file related to the matter in which action is sought to be taken, documentary evidence of a chain of title from the original owner to the assignee (e.g., copy of an executed assignment submitted for recording) or by specifying (e.g., reel and frame number) where such evidence is recorded in the Office. The submission establishing ownership must be signed by a party authorized to act on behalf of the assignee. Documents submitted to establish ownership may be required to be recorded as a condition to permitting the assignee to take action in a matter pending before the Office.

Enclosed with this Office action is a sample Certificate under **37 CFR 3.73(b)** which an assignee may use in order to ensure compliance with the Rule. Part A of the Certificate is used when there is a single assignment from the inventor(s). Part B of the Certificate is used when there is a chain of title. The "Copies of assignments..." box should be checked when the assignment document(s) (set forth in part A or part B) is/are not recorded in the Office, and a copy of the assignment document(s) is/are attached. When the "Copies of assignments..." box is

checked, either the part A box or the part B box, as appropriate, must be checked, and the "Reel_____, Frame_____" entries should be left blank. If the part B box is checked, and copies of assignments are not included, the "From:_____ To:_____" blank(s) must be filled in. This certificate should be used the first time an assignee seeks to take action in an application under **37 CFR 3.73(b)**.

3. REJECTIONS BASED ON DOUBLE PATENTING

a. *Non-statutory and non-obvious type w/ application*

The non-statutory double patenting rejection, whether of the obvious-type or non-obvious-type, is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "**right to exclude**" granted by a patent. ***In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Van Ornam*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); and *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993)**.

A timely filed terminal disclaimer in compliance with **37 CFR 1.321 (b)** and © may be used to overcome an actual or provisional rejection based on a non-statutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See **37 CFR 1.78 (d)**.

Effective January 1, 1994, a registered attorney or agent of record may sign a Terminal Disclaimer. A Terminal Disclaimer signed by the assignee must fully comply with **37 CFR 3.73(b)**.

Claims 1-18 are rejected under the judicially created doctrine of double patenting over claims 1-15 of U. S. Patent No. 5,657,206 since the claims, if allowed, would improperly extend the "**right to exclude**" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: **A semiconductor chip package comprising a substrate having bonding pads, a first insulation layer, a metal layer, a second insulation layer and an electrically conductive epoxy**.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. ***In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968)**. See also **MPEP § 804**.

4. REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --
(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

-- Claims 1-4, 8-10, 14 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Pat. No. 5,329,423 awarded to Scholz.

The applicant's recited "**substrate**" is represented by element **52**. The applicant's recited "**plurality of terminals**" are represented by elements **54** and **56**. The applicant's recited "**semiconductor chip**" is represented by element **46**. The applicant's recited "**bonding pads**" are represented by elements **48** and **50**. The applicant's recited "**first insulation layer**" is represented by element **72**. The applicant's recited "**metal layer**" is represented by element **66** or **68**. The applicant's recited "**second insulation layer**" is represented by element **70**. The applicant's recited "**electrically conductive epoxy**" is represented by element **58** or **60**. The applicant's recited "**means for maintaining a minimum bond thickness**" is represented by element **78**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

-- Claims 1-4, 8-10, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No 5,656,863 awarded to Yasunaga et al. in view of anyone of U.S. Pat. Nos. 4,578,215 and 4,818,823 both awarded to Bradley or U. S. Pat. No. 4,999,136 awarded to Su et al.

Claims 1-4, 8-10, 14 and 16 define over the structure of Yasunaga et al. (5,656,863) by the requirement that there is an **electrically conductive epoxy applied between the external connection points of the semiconductor chip and the terminals of the substrate** instead of the solder taught by Yasunaga et al. (5,656,863).

U.S. Pat. Nos. 4,578,215 and 4,818,823 both awarded to Bradley and U. S. Pat. No. 4,999,136 awarded to Su et al all establish that, before the invention by the applicant, those in the art recognized the functional interchange ability between solder and electrically conductive epoxy.

Thus, it would have been obvious to one possessing an ordinary level of skill at the time of the invention by the applicant to modify the invention of Yasunaga et al. (5,656,863) by replacing the solder of Yasunaga et al. (5,656,863) with an electrically conductive epoxy, as taught by anyone of the U.S. patents awarded to Bradley or the U. S. Patent awarded to Su et al., since Su et al. (4,999,136) establishes in column 1, lines 58-63 that **solder and electrically conductive adhesive are known functional equivalents and are interchangeably used for the same purpose**. ***Smith v. Hayashi, 209 USPQ 754 (Bd. of Pat. Inter. 1980)*** Furthermore, Su et al. (4,999,136) in column 1, lines 58-63, and Bradley (4,818,823) in column 1, lines 25-64, teach that the **use of electrically conductive epoxy instead of solder is particularly more attractive**

because electrically conductive epoxy is a much simpler and less expensive mounting procedure. Bradley (4,818,823) goes on in column 1, lines 34-54 to teach that the use of **solder requires the use of high temperatures and the cost involved with an attempt to minimize the shock effects of the high temperatures used in soldering procedures is high**.

-- Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 5,329,423 awarded to Scholz in view of anyone of U.S. Pat. No. 4,545,610 awarded to Lakritz et al., Japanese ref. (2-133936) or Japanese ref. (1-35528).

Claim 17 defines over the structure of Scholz (5,329,423) by the requirement that the is an **means for maintaining a minimum bond thickness includes at least one sphere**.

Lakritz et al. (4,545,610), Japanese ref. (2-133936) and Japanese ref. (1-35528) all establish that, before the invention by the applicant, is was known to **use spheres for the purpose of maintaining a desired thickness or spacing between external connections of a semiconductor chip and the terminals on a substrate**.

Thus, it would have been obvious to one possessing an ordinary level of skill at the time of the invention by the applicant to modify the invention of Scholz (5,329,423) by **using spheres to maintain a desired thickness between external connections of a semiconductor chip and the terminals on a substrate**, as taught by anyone of Lakritz et al. (4,545,610), Japanese ref. (2-133936) and Japanese ref. (1-35528), since Lakritz et al. (4,545,610) teaches in column 4, lines 23-28 that such a modification would **maintain the desired spacing between the semiconductor chip and the substrate** and Japanese ref. (1-35528) teaches that such a

modification would **prevent an uneven displacement or tilting of the mounted chip to the substrate**.

-- Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 5,329,423 awarded to Scholz in view of anyone of U.S. Pat. No. 4,545,610 awarded to Lakritz et al., Japanese ref. (2-133936) or Japanese ref. (1-35528) as applied to claim 17 above, and further in view of U.S. Pat. No. 4,545,840 awarded to Newman et al.

Claim 18 further limits the invention defined in claim 17 by the requirement that the **at least one sphere is a glass sphere**.

Newman et al. (4,545,840) teaches that, well before the invention by the applicant, it was known to use **glass spheres in an electrically conductive epoxy**.

Thus, it would have been obvious to one possessing an ordinary level of skill at the time of the invention by the applicant to further modify the invention of Scholz (5,329,423) by **using glass spheres in the electrically conductive epoxy to maintain a desired thickness between external connections of a semiconductor chip and the terminals on a substrate**, as taught by Newman et al. (4,545,840) in column 5, lines 23-28, since Newman et al. (4,545,840) teaches in column 5, lines 53-62 that because **glass spheres have a higher melting temperature than the electrically conductive epoxy, the spheres remain constant during the chip attachment step and therefore the gap between the semiconductor chip and the substrate also remain constant**.

-- Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No 5,656,863 awarded to Yasunaga et al. in view of anyone of U.S. Pat. Nos. 4,578,215 and 4,818,823 both awarded to Bradley or U. S. Pat. No. 4,999,136 awarded to Su et al. as applied to claims 1-4, 8-10, 14 and 16 above, and further in view of Japanese ref. (1-35528) and U.S. Pat. No. 4,545,840 awarded to Newman et al.

Claim 17 defines over the already modified structure of Yasunaga et al. (5,656,863) by the requirement that the **means for maintaining a minimum bond thickness includes at least one sphere** and claim 18 requires that the **at least one sphere is a glass sphere**.

Japanese ref. (1-35528) establish that, before the invention by the applicant, is was known to **at least one sphere for the purpose of maintaining a desired thickness or spacing between external connections of a semiconductor chip and the terminals on a substrate**.

Newman et al. (4,545,840) teaches that, well before the invention by the applicant, it was known to use **at least on glass sphere in an electrically conductive epoxy**.

Thus, it would have been obvious to one possessing an ordinary level of skill at the time of the invention by the applicant to further modify the invention of Yasunaga et al. (5,656,863) by **using glass spheres to maintain a desired thickness between external connections of a semiconductor chip and the terminals on a substrate**, as taught by Japanese ref. (1-35528) and Newman et al. (4,545,840), since Japanese ref. (1-35528) teaches that such a modification would **prevent an uneven displacement or tilting of the mounted chip to the substrate** and Newman et al. (4,545,840) teaches in column 5, lines 53-62 that because **glass spheres have a higher**

melting temperature than the electrically conductive epoxy, the spheres remain constant during the chip attachment step and therefore the gap between the semiconductor chip and the substrate also remain constant.

5. ACKNOWLEDGMENT OF ISSUES RAISED BY THE APPLICANT

Response to Amendment

Applicants' filed a request for a CPA on September 16, 1998, but failed to present any amendments or arguments concerning the examiner's rejection of the claims. Thus, the remarks made by the examiner in the Office action dated May 22, 1998 remain applicable and have been repeated in the instant office action.

a. ARGUMENTS CONCERNING FORMAL MATTERS

The applicant's traversal of the formal requirements requested by the examiner are addressed in the following section as required by **M.P.E.P. § 707.07(f)**.

:IMPORTANT NOTE:

As this action constitutes a final rejection, applicant's response must either comply with all formal requirements or specifically traverse each requirement not complied with. The examiner further draws the applicant's attention to **37**

C.F.R. § 1.113 and **37 C.F.R. § 1.116** regarding the submission of after-final responses and amendments.

b. ARGUMENTS CONCERNING PRIOR ART REJECTIONS

1st POINT OF ARGUMENT:

Regarding the applicant's amendment dated April 29,1998 specifically challenging the examiner and traversing the rejection of claims 1-4,8-10,14 and 16-18 based on the applicant's direct request to the examiner that the examiner provide evidence to support the examiner's position that **solder and electrically conductive adhesive are known functional equivalents and are interchangeably used for the same purpose**, The examiner directs the applicant's attention to U.S. Pat. Nos. 4,578,215 and 4,818,823 both awarded to Bradley and U. S. Pat. No. 4,999,136 awarded to Su et al. all of which are relied upon by the examiner in the above rejection. The examiner notes that as stated in **M.P.E.P. § 2144.03** these new references requested by the applicant are included in the rejection of the claims and the action still made **FINAL**.

2ND POINT OF ARGUMENT:

All arguments by the applicant are believed to be covered in the body of the office action or in the above remarks and thus, this action constitutes a complete response to the issues raised in the remarks dated April 29,1998.

Applicants have not presented any new arguments or amendments. Accordingly, **THIS ACTION IS MADE FINAL ON FIRST ACTION**. See **M.P.E.P. § 706.07(B)**. Applicant is reminded of the extension of time policy as set forth in **37 C.F.R. § 1.136(a)**.

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

6. CLOSING COMMENTS

Conclusion

a. STATUS OF CLAIMS IN THE APPLICATION

The following is a summary of the treatment and status of all claims in the application as recommended by **M.P.E.P. § 707.07(I)**:

a(1) CLAIMS REJECTED IN THE APPLICATION

Applicants have not presented any new remarks or amendments.

Accordingly, **THIS ACTION IS MADE FINAL ON FIRST ACTION**. See **MPEP § 706.07(b)**. Applicant is reminded of the extension of time policy as set forth in **37 CFR 1.136(a)**.

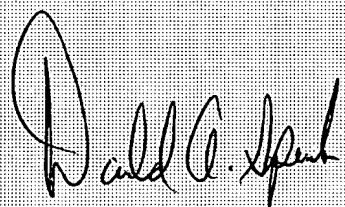
A shortened statutory period for response to this final action is set to expire **THREE MONTHS** from the date of this action. In the event a first response is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to **37 CFR 1.136(a)** will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than **SIX MONTHS** from the date of this final action.

For at least the above reasons it is the examiner's position that the applicant's claims are not in condition for allowance.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald A. Sparks whose telephone number is (703) 308-1756. The examiner can normally be reached on **Mon. thru Thurs.** from **6:30 A.M.** to **5:00 P.M.**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Leo P. Picard, can be reached on (703) 308-0538. The fax phone number for this Group is (703) 305-3431 or 3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1782.



Donald A. Sparks
Primary Examiner
Art Unit 2835

December 3, 1998